

## NPN General Purpose Amplifier

## MMBT2222

### FEATURES

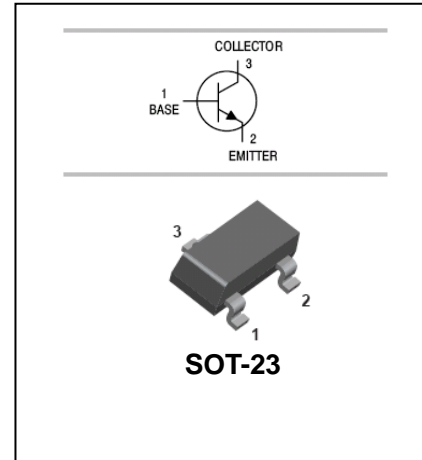
- Epitaxial planar die construction.
- Ultra-small surface mount package.



Lead-free

### APPLICATIONS

- Use as a medium power amplifier.
- Switching requiring collector currents up to 500mA.



### ORDERING INFORMATION

Type No.	Marking	Package Code
MMBT2222	M1B	SOT-23

### MAXIMUM RATING @ Ta=25°C unless otherwise specified

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	60	V
$V_{CEO}$	Collector-Emitter Voltage	30	V
$V_{EBO}$	Emitter-Base Voltage	5	V
$I_C$	Collector Current -Continuous	600	mA
$P_C$	Collector Dissipation	300	mW
$R_{\theta JA}$	Thermal resistance Junction to ambient	417	°C/W
$T_j, T_{stg}$	Junction and Storage Temperature	-55 to +150	°C



**NPN General Purpose Amplifier**

**MMBT2222**

**ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified**

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=10\mu A, I_E=0$	60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=10mA, I_B=0$	30			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10\mu A, I_C=0$	5			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=50V, I_E=0$			10	$\mu A$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=3V, I_C=0$			0.01	$\mu A$
DC current gain	$h_{FE}$	$V_{CE}=10V, I_C=150mA$	100		300	
		$V_{CE}=10V, I_C=0.1mA$	35			
		$V_{CE}=10V, I_C=1.0mA$	50			
		$V_{CE}=10V, I_C=10mA$	75			
		$V_{CE}=10V, I_C=500mA$	30			
		$V_{CE}=1V, I_C=150mA$	50			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=500mA, I_B=50mA$ $I_C=150mA, I_B=15mA$			1.6 0.4	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=500mA, I_B=50mA$ $I_C=150mA, I_B=15mA$			2.6 1.3	V
Transition frequency	$f_T$	$V_{CE}=20V, I_C=20mA$ $f=100MHz$	250			MHz
Output capacitance	$C_{obo}$	$V_{CB}=10V, I_E=0, f=1MHz$			8.0	pF
Input capacitance	$C_{ibo}$	$V_{EB}=0.5V, I_C=0, f=1MHz$			30	pF
Delay time	$t_d$	$V_{CC}=30V, V_{BE(off)}=0.5V$			10	ns
Rise time	$t_r$	$I_C=150mA, I_{B1}=15mA$			25	ns
Storage time	$t_s$	$V_{CC}=30V, I_C=150mA$			225	ns
Fall time	$t_f$	$I_{B1}=I_{B2}=15mA$			60	ns



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TYPICAL CHARACTERISTICS @  $T_a=25^\circ\text{C}$  unless otherwise specified

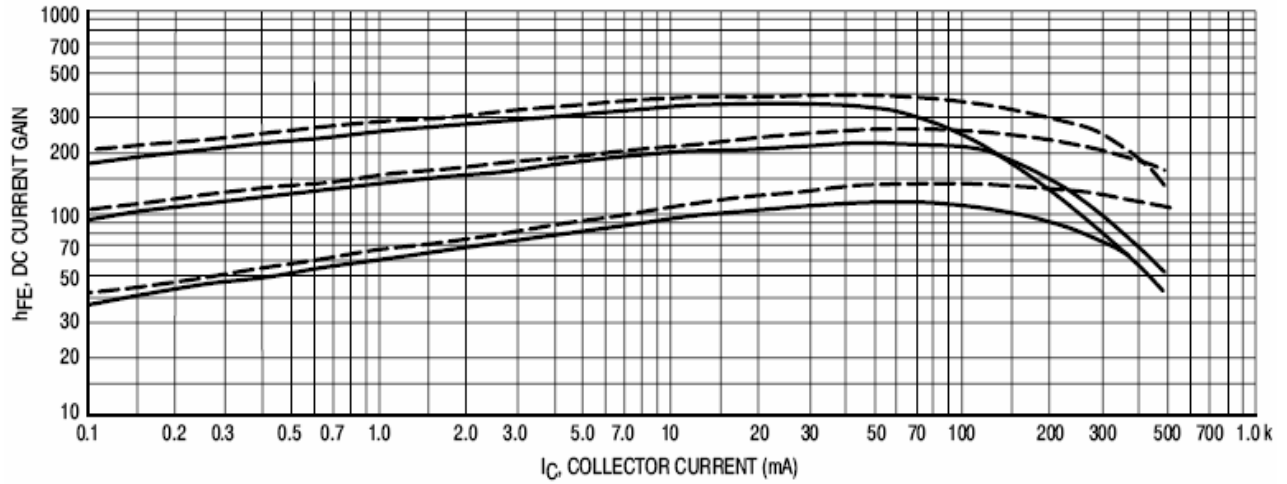


Figure 1. DC Current Gain

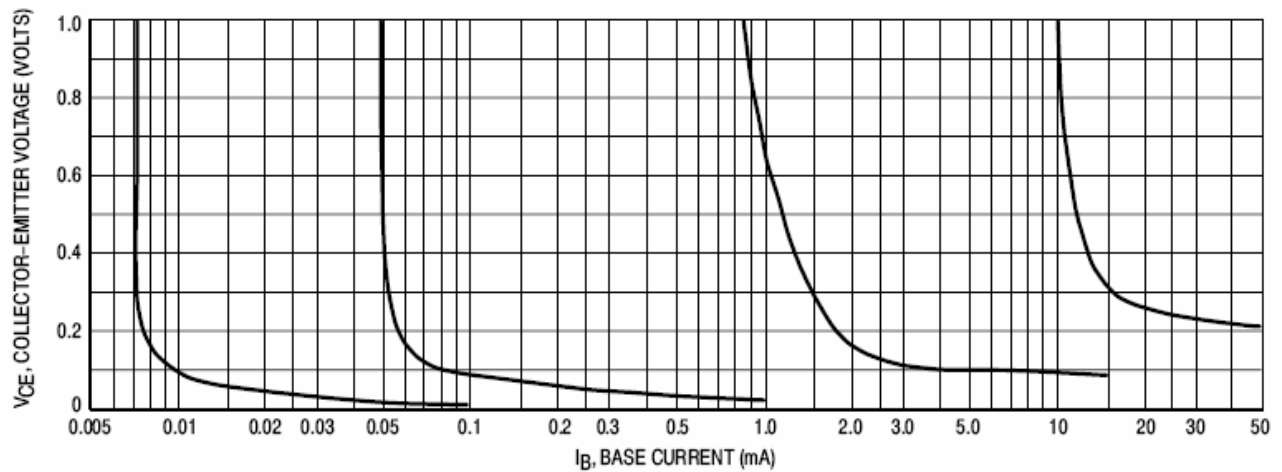


Figure 2. Collector Saturation Region

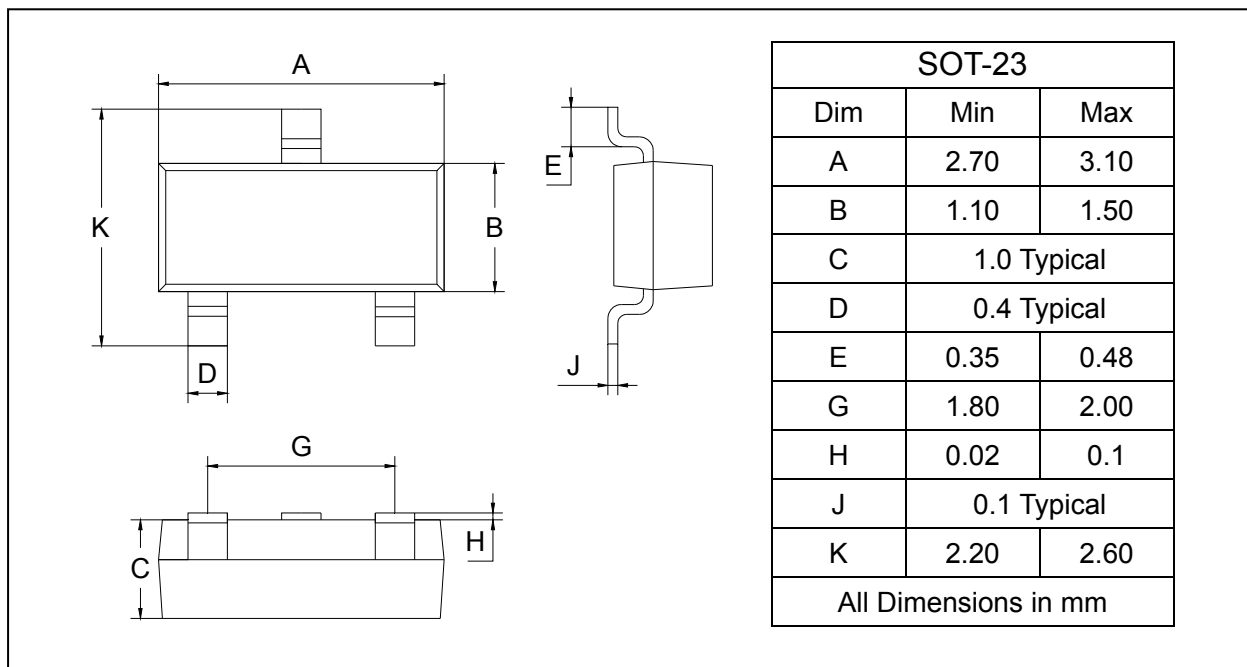
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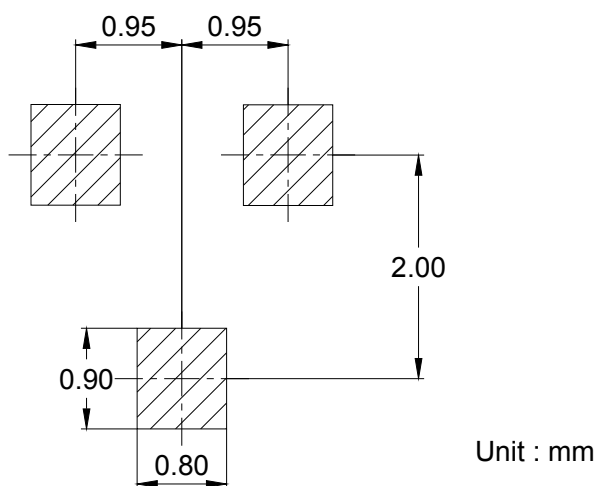
### PACKAGE OUTLINE

Plastic surface mounted package

SOT-23



### SOLDERING FOOTPRINT



### PACKAGE INFORMATION

Device	Package	Shipping
MMBT2222	SOT-23	3000/Tape&Reel